

	Type	L #	Hits	Search Text	DBs
1	IS&R	L1	14	((("4154050") or ("4355646") or ("4573481") or ("4640983") or ("4677989") or ("4860446") or ("4947866") or ("5040544") or ("5324328") or ("5423881") or ("5562722") or ("6216045") or ("6343233") or ("20030032997"))).PN.	US-PGPUB; USPAT
2	IS&R	L2	5719	((607/2) or (607/115-117) or (607/122) or (29/825) or (29/868) or (174/102R) or (174/103) or (174/106R) or (174/102C) or (174/119R) or (174/126.1-126.2)).CCLS.	US-PGPUB; USPAT
3	BRS	L3	3425	2 and @ad<"20010628"	US-PGPUB; USPAT
4	BRS	L4	57	3 and (inner adj core)	US-PGPUB; USPAT
5	BRS	L5	25	4 and (outer adj surface)	US-PGPUB; USPAT
6	BRS	L6	11	4 and (outer adj layer)	US-PGPUB; USPAT
7	BRS	L7	1	4 and (outer adj core)	US-PGPUB; USPAT
8	BRS	L8	31	5 or 6 or 7	US-PGPUB; USPAT
9	BRS	L9	14	8 and impedance	US-PGPUB; USPAT
10	BRS	L10	6	9 and (ohms or resistance)	US-PGPUB; USPAT
11	BRS	L11	2	9 and resistivity	US-PGPUB; USPAT

	Time Stamp	Comments	Error Definition	Errors
1	2005/05/07 19:10			
2	2005/05/07 19:12			
3	2005/05/07 19:12			
4	2005/05/07 19:12			
5	2005/05/07 19:13			
6	2005/05/07 19:13			
7	2005/05/07 19:13			
8	2005/05/07 19:13			
9	2005/05/07 19:13			
10	2005/05/07 19:14			
11	2005/05/07 19:14			

	Type	L #	Hits	Search Text	DBs
12	BRS	L12	6	10 or 11	US- PGPUB; USPAT
13	BRS	L13	8	9 not 12	US- PGPUB; USPAT

	Time Stamp	Comments	Error Definition	Errors
12	2005/05/07 19:15			
13	2005/05/07 19:15			

DETAILED ACTION

1. Acknowledgment is made of applicant's amendment and 3-month extension of time, which were received by the Office on March 21, 2005.

2. Claims 1-16 and 21 are canceled. Claims 17-20 are active.

Information Disclosure Statement

3. Acknowledgment is made of applicant's Information Disclosure Statement (PTO-1449), which was received by the Office on September 23, 2004.

Specification

4. In view of the applicant's modifications to the specification, the Examiner is withdrawing the objections which were made against the specification in the last Office action.

Claim Rejections - 35 USC § 102

5. In view of applicant's cancellation of claims 1-16 and 21, the Examiner is withdrawing the 35 U.S.C 102(b) rejections of Lessar et al '866 and Laske et al'341, which were made against claims 1-16 and 21 in the last Office action.

Allowable Subject Matter

6. Claims 17-20 are allowed.

Reasons for Allowance

7. The following is an examiner's statement of reasons for allowance:

Independent claim 17 describes the construction of a low impedance conductor for a low impedance extension. The conductor comprises a conductive outer surface and inner core having different impedances, but whose composite resistance ranges from 0.05-0.3 ohms per centimeter. Although the prior art references of record, recently submitted by the applicant, admit of conductors constructed with conductive inner cores and outer surfaces, these references primarily tout the use of platinum, silver, or copper inner cores surrounded by outer surfaces of either MP35N or titanium. According to the electrical resistivity property data supplied by MatWeb (see accompanying PTO-892), a composite sum of resistance between any two of these materials would still be orders of magnitude smaller than applicant's claimed range of 0.05-0.3 ohms per centimeter. The Examiner was unable to find a conductor having this arrangement with the resistance ranges claimed; consequently, the Examiner deems independent claim 17 and depending claims 18-20 to be allowable over the prior art of record.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

Application/Control Number: 10/686,108

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Art Unit: 3762

CHL

5/7/2005



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Platinum, Pt, CP Grade, Hard Drawn - 50% Cold Worked

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Subcategory: Metal; Nonferrous Metal; Precious Metal; Pure Metallic Element

Component Wt. %

Pt 99.95

Material Notes:

CP Grade (Commercially Pure) is 99.95% pure. Hard Drawn - 50% Cold Worked applies to strength, modulus, and hardness; other values are typical of Pt.

[Click here to view available vendors for this material.](#)

Physical Properties	Metric	English	Comments
Density	21.45 g/cc	0.775 lb/in ³	
Mechanical Properties			
Hardness, Knoop	103	103	Estimated from V
Hardness, Rockwell B	49	49	Estimated from V
Hardness, Vickers	90	90	
Tensile Strength, Ultimate	205 - 240 MPa	29700 - 34800 psi	
Elongation at Break	1 - 3 %	1 - 3 %	in : static in t
Modulus of Elasticity	156 GPa	22600 ksi	
Poisson's Ratio	0.39	0.39	
Shear Modulus	56 GPa	8120 ksi	Calculated
Electrical Properties			
Electrical Resistivity	1.06e-005 ohm-cm	1.06e-005 ohm-cm	Temperature Coefficient of resistivity: 0.0
Magnetic Susceptibility	1.1e-006	1.1e-006	

Thermal Properties

Heat of Fusion	<u>113 J/g</u>	48.6 BTU/lb
CTE, linear 20°C	<u>9.1 $\mu\text{m}/\text{m}\cdot^\circ\text{C}$</u>	5.06 $\mu\text{in}/\text{in}\cdot^\circ\text{F}$
Heat Capacity	<u>0.134 J/g-°C</u>	0.032 BTU/lb-°F
Thermal Conductivity	<u>69.1 W/m-K</u>	480 BTU-in/hr-ft ² -°F
Melting Point	<u>1769 °C</u>	3220 °F

Optical Properties

Emissivity (0-1)	0.152	0.152	at 1000°C for total hemisp
Emissivity (0-1)	0.3	0.3	€
Reflection Coefficient, Visible (0-1)	0.7	0.7	bulk Pt; €

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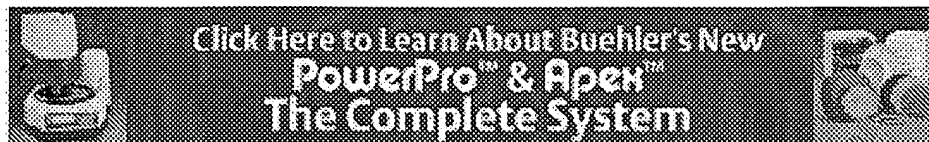
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Copper, Cu; Cold Drawn

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[Material supplier](#)**Subcategory:** Copper Alloy; Metal; Nonferrous Metal; Pure Metallic Element**Close Analogs:** See entry for annealed and cold worked copper.

Component	Wt. %
Cu	100

Material Notes:

Cold drawn applies only to tensile and/or hardness values; other property values are typical of the element. This entry is for pure Cu. Alloys will be included in the future.

[Click here](#) to view available vendors for this material.

Physical Properties	Metric	English	Comments
Density	<u>8.96 g/cc</u>	0.324 lb/in ³	
Mechanical Properties			
Hardness, Rockwell B	37	37	
Tensile Strength, Ultimate	<u>344 MPa</u>	49900 psi	
Tensile Strength, Yield	<u>333.4 MPa</u>	48400 psi	
Elongation at Break	14 %	14 %	
Modulus of Elasticity	<u>110 GPa</u>	16000 ksi	
Bulk Modulus	<u>140 GPa</u>	20300 ksi	
Poisson's Ratio	0.364	0.364	
Shear Modulus	<u>46 GPa</u>	6670 ksi	

Electrical Properties

* Electrical Resistivity	<u>1.7e-006 ohm-cm</u>	1.7e-006 ohm-cm
Magnetic Susceptibility	-8e-008	-8e-008

Thermal Properties


Heat of Fusion	<u>204.8 J/g</u>	88.1 BTU/lb	
CTE, linear 20°C	<u>16.4 µm/m-°C</u>	9.11 µin/in-°F	over the range 20.
CTE, linear 250°C	<u>18.5 µm/m-°C</u>	10.3 µin/in-°F	
CTE, linear 500°C	<u>20.2 µm/m-°C</u>	11.2 µin/in-°F	
CTE, linear 1000°C	<u>24.8 µm/m-°C</u>	13.8 µin/in-°F	at
Heat Capacity	<u>0.385 J/g-°C</u>	0.092 BTU/lb-°F	
Thermal Conductivity	<u>385 W/m-K</u>	2670 BTU-in/hr-ft²-°F	
Melting Point	1083.2 - 1083.6 °C	1980 - 1980 °F	

Optical Properties


Emissivity (0-1)	0.15	0.15	655 nm, 807°C, p
Reflection Coefficient, Visible (0-1)	0.63	0.63	

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Titanium, Ti

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[Material supplier](#)**Subcategory:** Metal; Nonferrous Metal; Pure Metallic Element; Titanium Alloy**Close Analogs:** A wide range of Ti alloys are listed in MatWeb. Titanium Grades 1,2,3,4,7,11,and 12 are all considered unalloyed. This listing is for 'pure' titanium.**Key Words:** biomaterials, biomedical implants, biocompatibility

Component	Wt. %
Ti	100

Material Notes:

This listing is for 'pure' titanium. Although unalloyed titanium is not very useful for structural applications, titanium is highly praised for their use in aerospace, high-temperature and biomedical applications. Titanium is difficult to machine or weld, but has significant advantages over traditional metals. For medical implants, titanium is considered one of the most biocompatible materials available, especially where direct contact to tissue or bone is required (i.e. endosseous dental implants or porous uncemented orthopedic implants). See the individual titanium alloy datasheets for specific applications.

[Click here to view available vendors for this material.](#)

Physical Properties	Metric	English	Comments
Density	4.5 g/cc	0.163 lb/in ³	
Mechanical Properties			
Hardness, Brinell	70	70	electro
Hardness, Vickers	60	60	
Tensile Strength, Ultimate	220 MPa	31900 psi	
Tensile Strength, Yield	140 MPa	20300 psi	
Elongation at Break	54 %	54 %	
Modulus of Elasticity	116 GPa	16800 ksi	

Poisson's Ratio	0.34	0.34
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Electrical Properties

* Electrical Resistivity	<u>5.54e-005 ohm-cm</u>	5.54e-005 ohm-cm
Magnetic Susceptibility	1.25e-006	1.25e-006
Critical Magnetic Field Strength, Oersted	56	56
Critical Superconducting Temperature	0.36 - 0.44 K	0.36 - 0.44 K

Thermal Properties

Heat of Fusion	<u>435.4 J/g</u>	187 BTU/lb	
CTE, linear 20°C	<u>8.9 µm/m-°C</u>	4.94 µin/in-°F	over the range 20-
CTE, linear 1000°C	<u>10.1 µm/m-°C</u>	5.61 µin/in-°F	
Heat Capacity	<u>0.528 J/g-°C</u>	0.126 BTU/lb-°F	
Thermal Conductivity	<u>17 W/m-K</u>	118 BTU-in/hr-ft²-°F	
Melting Point	1650 - 1670 °C	3000 - 3040 °F	

Optical Properties

Emissivity (0-1)	0.63	0.63	unoxidized; 6
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Aluminum, Al

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[Material supplier](#)**Subcategory:** Aluminum Alloy; Metal; Nonferrous Metal; Pure Metallic Element**Close Analogs:** Over 425 Al alloys are listed in MatWeb. Aluminum 1199 is the highest purity (99.99% Al min.) commercially available in structural form.

Component	Wt. %
Al	100

Material Notes:

This listing is for 'pure' aluminum.

[Click here](#) to view available vendors for this material.**Physical Properties**

	Metric	English	Comments
Density	<u>2.6989 g/cc</u>	0.0975 lb/in ³	

Mechanical Properties

Hardness, Vickers	15	15	An
Modulus of Elasticity	<u>68 GPa</u>	9860 ksi	
Shear Modulus	<u>25 GPa</u>	3630 ksi	

Electrical Properties


Electrical Resistivity	<u>2.7e-006 ohm-cm</u>	2.7e-006 ohm-cm	
Magnetic Susceptibility	6e-007	6e-007	
Critical Magnetic Field Strength, Oersted	101.9 - 107.9	101.9 - 107.9	
Critical Superconducting Temperature	1.73 - 1.77 K	1.73 - 1.77 K	

Thermal Properties

Heat of Fusion	<u>386.9 J/g</u>	166 BTU/lb	
CTE, linear 20°C	<u>24 $\mu\text{m}/\text{m}\cdot^\circ\text{C}$</u>	13.3 $\mu\text{in}/\text{in}\cdot^\circ\text{F}$	over the range 20.
CTE, linear 250°C	<u>25.5 $\mu\text{m}/\text{m}\cdot^\circ\text{C}$</u>	14.2 $\mu\text{in}/\text{in}\cdot^\circ\text{F}$	over the range 20.
CTE, linear 500°C	<u>27.4 $\mu\text{m}/\text{m}\cdot^\circ\text{C}$</u>	15.2 $\mu\text{in}/\text{in}\cdot^\circ\text{F}$	over the range 20.
Heat Capacity	<u>0.9 J/g-°C</u>	0.215 BTU/lb-°F	
Thermal Conductivity	<u>210 W/m-K</u>	1460 BTU-in/hr-ft ² -°F	
Melting Point	<u>660.37 °C</u>	1220 °F	

Optical Properties

Emissivity (0-1)	0.2 - 0.3	0.2 - 0.3	strongly o
Emissivity (0-1)	0.05	0.05	polished 50.
Reflection Coefficient, Visible (0-1)	0.9	0.9	tungste

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